Cerebral Palsy Alliance

NEWS
Cerebral Palsy Research

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Professor Nadia Badawi AM
Macquarie Group Foundation Chair of Cerebral Palsy

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Interventions and Management

1. Transcranial direct current stimulation and constraint-induced therapy in cerebral palsy: A randomized, blinded, sham-controlled clinical trial.

Gillick B, Rich T, Nemanich S, Chen CY, Menk J, Mueller B, Chen M, Ward M, Meekins G, Feyma T, Krach L, Rudser K.

Eur J Paediatr Neurol. 2018 Feb 11. pii: S1090-3798(17)31925-6. doi: 10.1016/j.ejpn.2018.02.001. [Epub ahead of print]

We investigated the safety, feasibility, and efficacy of transcranial direct current stimulation (tDCS) combined with constraint -induced movement therapy (CIMT) in children and young adults with unilateral cerebral palsy. Twenty participants were randomized to receive active or sham tDCS. The intervention consisted of 10 consecutive weekday sessions of tDCS applied to the non-lesioned hemisphere (20 min) concurrently with CIMT (120 min). Participants, caregivers, and interventionists were blinded to group assignment. The primary safety outcome investigated adverse events. The primary behavioral outcome was the Assisting Hand Assessment. All 20 participants (mean age = 12.7 yrs, range = 7.4-21.6 years) were evaluated for the primary outcomes. No serious adverse events occurred, and the most commonly reported minor adverse events were headache and itchiness. Both groups demonstrated a significant improvement in hand function after the intervention, although no significant effect of tDCS was observed (between-group difference = -2.18, 95% CI = [-6.48, 2.12], p = 0.30). Although hand function improved overall, no significant differences between intervention groups were found. Children with preserved corticospinal tract circuitry from the lesioned hemisphere, compared to those without, showed greater improvement in hand function (mean difference = 3.04, 95% CI = [-0.64, 6.72], p = 0.099). Our study demonstrates the safety and feasibility of serial sessions of tDCS, and presents preliminary evidence for the effect of CST circuitry on outcomes following tDCS/CIMT. Future work in children with unilateral cerebral palsy should focus on the optimal dosing and consider individual brain circuitry when describing response to combined interventions.

PMID: 29456128

2. Practical Considerations of the Both Hands Assessment (BoHA): A commentary on "Development and Validation of the Both Hands Assessment for Children with Bilateral Cerebral Palsy".

Arnould C.

Phys Occup Ther Pediatr. 2018 May;38(2):127-129. doi: 10.1080/01942638.2018.1433428.

[No abstract available]

PMID: 29495941

3. Promoting optimal bimanual performance in cerebral palsy.

Pearse J.

Dev Med Child Neurol. 2018 Feb 22. doi: 10.1111/dmcn.13713. [Epub ahead of print]

[This commentary is on the original article by Klevberg et al.]

PMID: 29468665

4. A magic-themed upper limb intervention for children with unilateral cerebral palsy: The perspectives of parents.

Hines A, Bundy AC, Haertsch M, Wallen M.

Dev Neurorehabil. 2018 Feb 26:1-7. doi: 10.1080/17518423.2018.1442372. [Epub ahead of print]

AIM: To explore parent's perspective of their child's participation in a magic-themed intervention called Amazing Magic Club (AMC), and to further our understanding of motivated engagement and the impact of themed group-based interventions for children with unilateral cerebral palsy (CP). METHODS: Twenty-nine parents of children with unilateral CP completed semi-structured interviews. The child participants (n = 28) attended one of three AMCs; average age of the children was 10y 6mo (SD 2y 2mo). The parent interviews were analysed using thematic analysis. RESULTS: The three themes are: "It's okay to be me", the magic effect and "I can do it". Parents observed their children to belong and learn about their abilities. The importance of the magicians and the performance is described. Parents observed their children to have increased self-belief and a new willingness to attempt difficult tasks. DISCUSSION: AMC appears to capture intrinsic motivation for children with unilateral CP to complete challenging tasks.

PMID: 29482472

5. To Explore the Validity of Change Scores of the Children's Hand-use Experience Questionnaire (CHEQ) in Children with Unilateral Cerebral Palsy.

Ryll UC, Eliasson AC, Bastiaenen CH, Green D.

Phys Occup Ther Pediatr. 2018 Feb 26:1-13. doi: 10.1080/01942638.2018.1438554. [Epub ahead of print]

AIMS: To explore the validity of change scores of the Children's Hand-use Experience Questionnaire (CHEQ). METHODS: Analysis of the CHEQ included 44 children (15 girls) between 6-16 years (median 9.0; IQR 8-11) with unilateral cerebral palsy, with baseline and post- (two-week intensive) intervention assessments using the Goal Attainment Scale (GAS) as external anchor for change. Hypotheses on the magnitude of expected change were formulated and correlation coefficients and effect sizes calculated. Receiver operating curve analysis was performed and the area under the curve (AUC) calculated to investigate the ability of CHEQ to discriminate between improvement and non-improvement according to GAS. RESULTS: All hypotheses about the magnitude of change were confirmed supporting longitudinal validity of CHEQ scales to measure change in the perception of bimanual performance. AUCs for the Grasp efficacy and the Time utilization were slightly below, and for the Feeling bothered slightly above the threshold. The latter one accurately discriminating between children that improved and did not improve according to the GAS. CONCLUSIONS: Evidence was found that CHEQ scales capture change in bimanual performance but with limited accuracy for two out of three scales. The validity of CHEQ change scores needs to be further explored in a wider population.

PMID: 29482408

6. Neurologic music therapy in upper-limb rehabilitation in children with severe bilateral cerebral palsy: a randomized controlled trial.

Marrades-Caballero E, Santonja-Medina CS, Sanz-Mengibar JM, Santonja-Medina F.

Eur J Phys Rehabil Med. 2018 Feb 26. doi: 10.23736/S1973-9087.18.04996-1. [Epub ahead of print]

BACKGROUND: After receiving neurologic music therapy, functional improvements in children with severe bilateral cerebral palsy have not been found in the literature. Musical training with instruments allows interrelationships between movement, emotions and cognition for task-based learning, in order to improve motor control. AIM: To understand whether neurologic music therapy has an impact on the functionality of children with severe cerebral palsy. DESIGN: A randomized controlled assessor-blind trial was carried out. SETTING: Children were recruited and treated in their own community center. POPULATION: Eighteen children with severe bilateral cerebral palsy between 4 and 16 years old were studied. METHODS: The intervention group (n=18) received music therapy for 16 weeks, in addition to its usual physiotherapy input. Two music therapists implemented a neurologic music therapy program of therapeutic instrumental music performance. The control group (n=9) received its usual therapeutic input, similar to the intervention group, but not neurologic music therapy. Overall and specific "Chailey levels of Ability" were quantified, as well as the Locomotor Stages. RESULTS: Significant improvements in the overall and specific "arm and hand position" as well as "activities" from the Chailey Levels of Ability and the Locomotor Stages were observed (p<.05) in the group which received the music therapy (corregir si se acepta en la editing proofs). All these improvements persisted after 4 months. The control group showed no improvements after a four-month follow-up. CONCLUSIONS: Optimized intervention of neurologic music therapy can improve the functionality of children with severe bilateral cerebral palsy. REHABILITATION IMPACT: Music therapy is a useful tool in rehabilitation and its positive effects remain four months after completing the treatment.

PMID: 29484877

7. Sit Still and Pay Attention! Trunk Movement and Attentional Resources in Infants with Typical and Delayed Development.

Berger SE, Harbourne RT, Guallpa Lliguichuzhca CL.

Phys Occup Ther Pediatr. 2018 Feb 21:1-12. doi: 10.1080/01942638.2018.1432005. [Epub ahead of print]

AIMS: (1) examine infant movement during an early posture (sitting) utilizing a novel video assessment technique; and (2) document the differences between infants with typical development (TD), premature infants with motor delay, and infants with cerebral palsy (CP) during focused and nonfocused attention (NFA). METHODS: Infants were tested when they began to sit independently. We utilized Eulerian Video Magnification (EVM) to accentuate small trunk and pelvic movements for visual coding from video taken during a natural play task with and without focused attention (FA). RESULTS: Trunk/pelvic movement varied as a function of both motor skill and attention. Infants with TD and CP made fewer trunk movements during periods of FA than NFA. Preterm infants exhibited more trunk/pelvic movement than the other groups and their movement did not differ based on attention type. CONCLUSIONS: The EVM technique allowed for replicable coding of real-time "hidden" motor adjustments from video. The capacity to minimize extraneous movements in infants, or "sitting still" may allow greater attention to the task at hand, similar to older children and adults. Premature infants' excessive trunk/pelvic movement that did not adapt to task requirements could, in the long term, impact tasks requiring attentional resources.

PMID: 29465319

8. Impact of Hippotherapy on Gross Motor Function and Quality of Life in Children with Bilateral Cerebral Palsy: A Randomized Open-Label Crossover Study.

Deutz U, Heussen N, Weigt-Usinger K, Leiz S, Raabe C, Polster T, Daniela S, Moll C, Lücke T, Krägeloh Mann I, Hollmann H, Häusler M.

Neuropediatrics. 2018 Feb 27. doi: 10.1055/s-0038-1635121. [Epub ahead of print]

This study investigated the effect of hippotherapy on gross motor function (Gross Motor Function Measure [GMFM]-66, GMFM dimension E and D) and quality of life (Child Health Questionnaire [CHQ 28], KIDSCREEN-27 parental versions) in children with bilateral spastic cerebral palsy. Seventy-three children (age: 9.1 ± 3.3 years; male = 44; GMFCS levels II = 27; III = 17; IV = 29) were randomized to an early (n = 35) or late (n = 38) treatment group. Data from 66 probands were available for further analysis. Probands received hippotherapy once to twice weekly during a period of 16 to 20 weeks (mean: 17 treatments) in a crossover approach. Whereas no significant changes were found for total GMFM scores and quality of life parameters, a

significant increase in GMFM dimension E was found. Children terminating the study early showed lower mean psychosocial quality of life scores than children who completed the whole study (CHQ-28 "psychosocial dimension"; KIDSCREEN-27 "mood and emotional dimension"). Our data are in line with previous reports and suggest that hippotherapy shows distinct therapeutic strengths with regard to promoting upright stand and gait in children with cerebral palsy. Children with higher psychosocial burden of disease may need special support to get access to and benefit from intensified physiotherapy programs.

PMID: 29486504

9. Addition of an educational programme for primary caregivers to rehabilitation improves self-care and mobility in children with cerebral palsy: a randomized controlled trial.

Saquetto MB, de Santana Bispo A, da Silva Barreto C, Gonçalves KA, Queiroz RS, da Silva CM, Gomes Neto M.

Clin Rehabil. 2018 Feb 1:269215518757051. doi: 10.1177/0269215518757051. [Epub ahead of print]

OBJECTIVE: To assess whether the addition of an education programme for primary caregivers to rehabilitation improves daily functioning in children with cerebral palsy. DESIGN: A randomized, single-blind, controlled study. SETTING: This study was conducted in a rehabilitation centre in Salvador, Brazil. PARTICIPANTS: A total of 63 boys and girls with cerebral palsy, at 1-12 years of age, with Gross Motor Function Classification Systems I-V, were randomly assigned to two groups: educational programme for primary caregivers and conventional rehabilitation (n = 29) or conventional rehabilitation alone (n = 31). INTERVENTION: Each group received 12 sessions of 30 minutes of conventional rehabilitation and 12 sessions of 45 minutes to intervention group. MEASUREMENTS: Gross Motor Function Classification System, Gross Motor Function Measure and daily functioning with the Pediatric Evaluation of Disability Inventory were assessed by a blinded assessor. The clinical outcomes were obtained at the completion of treatment (12 weeks). RESULTS: Of the 63 patients included, 60 (mean ± SD age: 4.6 ± 2.74 years) completed the protocol. The combined education and rehabilitation, as compared with conventional rehabilitation alone, yielded significantly greater benefit in the self-care domain of the Functional Skills Scale (mean change 1.74 versus 5; P = 0.001), self-care (mean change 5.52 versus 13.99; P = 0.017) and the mobility domain of the Caregiver Assistance Scale of Pediatric Evaluation of Disability Inventory (mean change 0.87 versus 17.88; P = 0.002). CONCLUSION: Self-care and mobility improved in children with cerebral palsy with the addition to conventional rehabilitation of an educational programme for primary caregivers.

PMID: 29493280

10. To switch from Botox to Dysport in children with CP, a real world, dose conversion, cost-effectiveness study.

Tedroff K, Befrits G, Tedroff CJ, Gantelius S.

Eur J Paediatr Neurol. 2018 Feb 3. pii: S1090-3798(17)31754-3. doi: 10.1016/j.ejpn.2018.01.023. [Epub ahead of print]

BACKGROUND AND OBJECTIVES: Children with cerebral palsy (CP) are routinely treated with botulinum toxin A (BoNT-A). Two non dose-equivalent and differently priced products, Botox and Dysport are used. Depending on the conversion one of the products is considerably cheaper. However, the dose conversion factors studied to date have varied widely and relevant studies have not included children. Our objective here was to compare the efficacy and health economics of the switch from Botox to Dysport in children with CP when conversion was set to 1:2. Specifically were these treatments perceived as equivalent in terms of efficacy, duration and side-effects and were the drug cost lowered by using Dysport. METHODS: This prospective, real-world, cost-effectiveness population-based observational study included all children with CP, (n = 159) mean age 9.4 years (SD, 4.3), in the larger Stockholm area who received BoNT-A between September 1, 2014, and December 31, 2015. Parents reported the efficacy, duration and side-effects of previous treatment while physicians reported doses and goals set by children and parents for the present treatment. Drug acquisition costs were provided by county administrators.RESULTS: In connection with 341 visits caregivers reported comparable effects of similar duration with these products, with few, similar and transient side-effects. The drug-cost per treatment was 4029 SEK for Botox and 2380 SEK in the case of Dysport. CONCLUSION: When Botox was replaced by a two-fold higher Unit dose of Dysport (conversion 1:2) parents perceived the treatment of their children with CP to be equally effective while the cost was 41% lower according to procured prices.

PMID: 29452742

11. Inter- and intra-interviewer reliability of Italian version of Pediatric Evaluation of Disability Inventory (I-PEDI).

Murgia M, Bernetti A, Delicata M, Massetti C, Achilli EM, Mangone M, Ioppolo F, Di Sante L, Santilli V, Galeoto G, Agostini F, Venditto T.

Ann Ig. 2018 Mar-Apr;30(2):153-161. doi: 10.7416/ai.2018.2206.

BACKGROUND: Childhood disabilities determine a range of immediate and long-term economic costs that have important implications for the well-being of the child, the family and the society. The Pediatric Evaluation of Disability Inventory (PEDI) measures capability and performance in children aged between 6 months and 7.5 years. It contains three scales: Functional Skills Scales (FSS), Caregiver Assistance Scale (CAS) and Modifications Scale (MS). The present study evaluated the measurement properties of the Italian version of the PEDI (PEDI-I) in patients with spastic cerebral palsy (CP). STUDY DESIGN: Reliability study. METHODS: The original PEDI was translated - including a cross-cultural adaptation - into Italian. Internal consistency and test-retest reliability were evaluated.
RESULTS: Fifty-eight children with CP were recruited. According to inter-interviewer reproducibility, the FSS domain revealed intraclass orrelation coefficient (ICC) values ranging between 0.94 and 1.00. CAS domain revealed ICC values ranging between 0.94 and 1.00. The SEM values ranged between 3.25 (SDD=8.98) for SF and 5.24 for SC (SDD=14.5). According to intra-interviewer reproducibility, the FSS domain revealed ICC values ranging between 0.99 and 1.00. CAS domain revealed ICC values ranging between 0.92 and 0.99. The SEM values ranged between 3.44 (SDD=9.5) for SF and 3.75 for SC (SDD=10.36). The inter-interviewer and intra-interviewer reproducibility results showed very high ICC values for both FFS and CAS domains. Cronbach's α ranged between 0.94 and 0.99, indicating excellent internal consistency within each domain of the PEDI-I. CONCLUSION: The inter-interviewer and intra-interviewer reproducibility results of PEDI-I showed very high ICC values for FFS and CAS domains. Therefore, we recommend its application to evaluate the effect of treatment in children with CP.

PMID: 29465152

12. Quantification of Muscle Tissue Properties by Modeling the Statistics of Ultrasound Image Intensities Using a Mixture of Gamma Distributions in Children With and Without Cerebral Palsy.

Sikdar S, Diao G, Turo D, Stanley CJ, Sharma A, Chambliss A, Laughrey L, Aralar A, Damiano DL.

J Ultrasound Med. 2018 Feb 20. doi: 10.1002/jum.14566. [Epub ahead of print]

OBJECTIVES: To investigate whether quantitative ultrasound (US) imaging, based on the envelope statistics of the backscattered US signal, can describe muscle properties in typically developing children and those with cerebral palsy (CP). METHODS: Radiofrequency US data were acquired from the rectus femoris muscle of children with CP (n = 22) and an age-matched cohort without CP (n = 14) at rest and during maximal voluntary isometric contraction. A mixture of gamma distributions was used to model the histogram of the echo intensities within a region of interest in the muscle. RESULTS: Muscle in CP had a heterogeneous echo texture that was significantly different from that in healthy controls ($P < .001$), with larger deviations from Rayleigh scattering. A mixture of 2 gamma distributions showed an excellent fit to the US intensity, and the shape and rate parameters were significantly different between CP and control groups ($P < .05$). The rate parameters for both the single gamma distribution and mixture of gamma distributions were significantly higher for contracted muscles compared to resting muscles, but there was no significant interaction between these factors (CP and muscle contraction) for a mixed-model analysis of variance. CONCLUSIONS: Ultrasound tissue characterization indicates a more disorganized architecture and increased echogenicity in muscles in CP, consistent with previously documented increases in fibrous infiltration and connective tissue changes in this population. Our results indicate that quantitative US can be used to objectively differentiate muscle architecture and tissue properties.

PMID: 29460971

13. A Comparison of Spastic Diplegia in Term and Preterm-Born Children.

Jauhari P, Singhi P, Sankhyan N, Malhi P, Vyas S, Khandelwal N.

J Child Neurol. 2018 Jan 1:883073817754175. doi: 10.1177/0883073817754175. [Epub ahead of print]

This study compared the risk factors and clinical and radiologic profile of children with spastic diplegic cerebral palsy born at term (≥37 weeks) with those born preterm. Children (2-14 years) with cerebral palsy meeting the study criteria for spastic diplegia were enrolled. Antecedent risk factors, clinical profile, and magnetic resonance imaging (MRI) findings were recorded. Spasticity, functional ability, intellectual ability, and social quotient were assessed using standard scales. Ninety-

three children met the study inclusion criteria (45 term, 48 preterm). Moderate to severe intellectual disability (53% vs 21%, P = .001) and epilepsy (51% vs 33%) were significantly more common in term-born children, whereas periventricular white matter injury was less common in term-born children (64%vs 89.4%, P = .004). Term spastic diplegia was associated with cortical/subcortical involvement in (11/42 (26%) vs 3/47(6.4%); P = .01). We conclude that term-spastic-diplegia is clinicopathologically different from preterm-spastic-diplegia. Their neuroradiologic pattern also differs with more frequent involvement of cortical/subcortical areas.

PMID: 29464974

14. Clinician perspectives and experiences in the prescription of ankle-foot orthoses for children with cerebral palsy.

Kane K, Manns P, Lanovaz J, Musselman K.

Physiother Theory Pract. 2018 Feb 21:1-9. doi: 10.1080/09593985.2018.1441346. [Epub ahead of print]

PURPOSE: Physiotherapists, orthotists, and physicians are involved in the prescription of ankle-foot orthoses (AFOs) for children with cerebral palsy (CP); however, little is known about how prescription decisions are made in practice. Therefore, the study objective was to identify current AFO prescription and clinical decision-making practices for children with CP in Canada. METHODS: Focus groups were conducted in five pediatric rehabilitation facilities, with 32 clinicians. Semi-structured interviews focused on the goals and types of AFOs used, referral and follow-up processes, and clinical evaluation measures. Interpretive Description was used as a framework for analysis. Transcribed dialogue was imported into NVivo 11 for data coding and analysis. Three researchers participated in coding to establish categories and themes. RESULTS: Categories included: what is made, how it is used, and factors that either support or challenge outcomes. Strengths and challenges of the current prescription process were discussed, including funding, communication, and technology to enhance clinical evaluation. Throughout the interviews, the theme of prescription as a collaborative, iterative, and individualized process emerged. CONCLUSIONS: Processes, strengths, and challenges associated with AFO prescription in Canada were identified. This is a first step toward the development of guidelines to help clinicians improve AFO prescription for children with CP.

PMID: 29465276

15. Surgical correction of hallux valgus deformity in children with cerebral palsy.

Sarikaya IA, Seker A, Erdal OA, Talmac MA, Inan M.

Acta Orthop Traumatol Turc. 2018 Feb 22. pii: S1017-995X(17)30120-7. doi: 10.1016/j.aott.2018.01.008. [Epub ahead of print]

OBJECTIVE: This study aimed to present a treatment algorithm for the correction of the hallux valgus deformity in Cerebral Palsy (CP) patients and to discuss the outcomes based on our clinical and radiological results. METHODS: 29 patients (45 feet) were included in the study. The mean age of the patients at the time of the surgery was 14 (range 6-22) years. The mean follow-up was 33 (range 22-59) months. A reconstructive procedure was performed on 19 patients (27 feet); a soft tissue surgery and exostectomy of the bunion in six patients (11 feet); and MTP joint arthrodesis in four patients (7 feet). The hallux valgus angle (HVA) and the anteroposterior intermetatarsal angle (IMA) were used for radiologic evaluation and the DuPont Bunion Rating Score was used for clinical evaluation. RESULTS: The follow-up period was 36 (range 22-59) months in reconstructive group, 27 (range 24-29) months in soft tissue group, and 29 (range 23-41) months in MTP arthrodesis group. Significant improvements were detected in hallux valgus angle in three groups postoperatively but in soft tissue group correction loss was observed during follow up. Best results were achieved in arthrodesis group and worse in soft tissue group in terms of clinical evaluation. CONCLUSION: According to our results isolated soft tissue procedures are ineffective in CP patients. Soft tissue procedure combined with metatarsal osteotomy has satisfactory results. LEVEL OF EVIDENCE: Level IV, therapeutic study.

PMID: 29478778

16. Abstracts for the Australasian Academy of Cerebral Palsy and Developmental Medicine, Auckland, New Zealand, 21-24 March 2018.

[No authors listed]

Dev Med Child Neurol. 2018 Mar;60 Suppl 1:3-60. doi: 10.1111/dmcn.13718.

PMID: 29488215

17. Evaluation of Functional Status Associated With Overweight in Adults With Cerebral Palsy.

de la Torre-Olivares R, Moreno-Lorenzo C, Pérez-Mármol JM, Cabrera-Martos I, Villaverde-Gutierrez C, Sánchez AMC, Aguilar-Ferrándiz ME.

Rehabil Nurs. 2018 Mar/Apr;43(2):88-94. doi: 10.1097/RNJ.0000000000000056.

PURPOSE: The aim of this study was to describe the motor disability level of ambulatory adults with overweight and cerebral palsy (CP) and to investigate the functional factors associated with weight gain in this population. DESIGN: Cross-sectional study. METHODS: Thirty adults with CP were classified according to their body mass index (BMI). Mobility, physical disability, functional independence, gait and balance, gross motor function, and maximum walking speed were assessed to evaluate their physical status. The influence of demographic and functional factors on BMI was analyzed using bivariate and multivariate regression analyses. FINDINGS: Multiple regression analyses showed that age ($p = .012$) and lower cardiorespiratory function/lower walking distance ($p = .048$) were significantly associated with higher BMI. Other functional outcomes were not associated with BMI. CONCLUSIONS: Greater age and reduced walking distance related to cardiorespiratory function seem to be the main factors associated with BMI. CLINICAL RELEVANCE: Cardiorespiratory rehabilitation is recommended in conjunction with nutritional nursing interventions.

PMID: 29499006

18. Basic visual perceptual processes in children with typical development and cerebral palsy: The processing of surface, length, orientation, and position.

Schmetz E, Magis D, Detraux JJ, Barisnikov K, Rousselle L.

Child Neuropsychol. 2018 Mar 2:1-31. doi: 10.1080/09297049.2018.1441820. [Epub ahead of print]

The present study aims to assess how the processing of basic visual perceptual (VP) components (length, surface, orientation, and position) develops in typically developing (TD) children ($n = 215$, 4-14 years old) and adults ($n = 20$, 20-25 years old), and in children with cerebral palsy (CP) ($n = 86$, 5-14 years old) using the first four subtests of the Battery for the Evaluation of Visual Perceptual and Spatial processing in children. Experiment 1 showed that these four basic VP processes follow distinct developmental trajectories in typical development. Experiment 2 revealed that children with CP present global and persistent deficits for the processing of basic VP components when compared with TD children matched on chronological age and nonverbal reasoning abilities.

PMID: 29498326

19. Acoustic Predictors of Pediatric Dysarthria in Cerebral Palsy.

Allison KM, Hustad KC.

J Speech Lang Hear Res. 2018 Feb 20:1-17. doi: 10.1044/2017_JSLHR-S-16-0414. [Epub ahead of print]

PURPOSE: The objectives of this study were to identify acoustic characteristics of connected speech that differentiate children with dysarthria secondary to cerebral palsy (CP) from typically developing children and to identify acoustic measures that best detect dysarthria in children with CP. METHOD: Twenty 5-year-old children with dysarthria secondary to CP were compared to 20 age- and sex-matched typically developing children on 5 acoustic measures of connected speech. A logistic regression approach was used to derive an acoustic model that best predicted dysarthria status. RESULTS: Results indicated that children with dysarthria secondary to CP differed from typically developing children on measures of multiple segmental and suprasegmental speech characteristics. An acoustic model containing articulation rate and the F2 range of diphthongs differentiated children with dysarthria from typically developing children with 87.5% accuracy. CONCLUSION: This study serves as a first step toward developing an acoustic model that can be used to improve early identification of dysarthria in children with CP.

PMID: 29466556

20. Dysarthria in Mandarin-Speaking Children With Cerebral Palsy: Speech Subsystem Profiles.

Chen LM, Hustad KC, Kent RD, Lin YC.

J Speech Lang Hear Res. 2018 Feb 22:1-24. doi: 10.1044/2017_JSLHR-S-17-0065. [Epub ahead of print]

PURPOSE: This study explored the speech characteristics of Mandarin-speaking children with cerebral palsy (CP) and typically developing (TD) children to determine (a) how children in the 2 groups may differ in their speech patterns and (b) the variables correlated with speech intelligibility for words and sentences.
METHOD: Data from 6 children with CP and a clinical diagnosis of moderate dysarthria were compared with data from 9 TD children using a multiple speech subsystems approach. Acoustic and perceptual variables reflecting 3 speech subsystems (articulatory-phonetic, phonatory, and prosodic), and speech intelligibility, were measured based on speech samples obtained from the Test of Children's Speech Intelligibility in Mandarin (developed in the lab for the purpose of this research).
RESULTS: The CP and TD children differed in several aspects of speech subsystem function. Speech intelligibility scores in children with CP were influenced by all 3 speech subsystems, but articulatory-phonetic variables had the highest correlation with word intelligibility. All 3 subsystems influenced sentence intelligibility. CONCLUSION: Children with CP demonstrated deficits in speech intelligibility and articulation compared with TD children. Better speech sound articulation influenced higher word intelligibility, but did not benefit sentence intelligibility.

PMID: 29471380

21. A controlled study comparing salivary osmolality, caries experience and caries risk in patients with cerebral palsy.

Ruiz LA, Diniz MB, Loyola-Rodriguez JP, Habibe CH, Garrubbo CC, Santos MT.

Med Oral Patol Oral Cir Bucal. 2018 Mar 1;23(2):e211-e215. doi: 10.4317/medoral.22135.

BACKGROUND: Cerebral palsy (CP) is a permanent neurological disorder accompanied by secondary musculoskeletal masticatory disorder, with repercussion on chewing and deglutition functions. In these conditions, the liquids ingestion is compromised resulting in salivary osmolality alteration. The objective of this study was to compare salivary osmolality, caries experience and caries risk between normoreactive individuals and patients with CP. MATERIAL AND METHODS: The participants were 4-20 years old: 52 patients with CP treated at a reference rehabilitation centre (study group, SG), and 52 normoreactive individuals (control group, CG). Saliva was collected for five minutes using cotton rolls. Following centrifugation, salivary osmolality was determined by freezing point depression osmometry. Evaluations included caries experience (DMFT index), and caries risk based on a caries-risk assessment tool (CAT). Descriptive and inferential statistics (Chi square and Student t tests) were used to compare the groups. Receiver operating characteristic (ROC) analyses were performed and the area under the ROC curve (Az) was calculated. The level of significance was set at 5%. RESULTS: The groups were homogeneous for sex ($p=0.843$) and age ($p=0.128$). In the SG, spastic type CP was the most prevalent (80.8%), and patients showed significantly higher salivary osmolality values compared with the CG ($p<0.001$). No significant differences in caries experience ($p=0.159$) or caries risk ($p=0.297$) were observed. ROC curve analysis determined a salivary osmolality cutoff point of >74 for the SG and >54 for the CG in the presence of dental caries. A significant correlation was verified between salivary osmolality and the DMFT index for the SG ($p\leq0.05$). CONCLUSIONS: Although patients with CP showed higher salivary osmolality values, higher caries experience and caries risk were not observed compared with normoreactive individuals.

PMID: 29476677

22. Pharmacological interventions for treating sialorrhea associated with neurological disorders: A mixed treatment network meta-analysis of randomized controlled trials.

Sridharan K, Sivaramakrishnan G.

J Clin Neurosci. 2018 Feb 20. pii: S0967-5868(17)32016-7. doi: 10.1016/j.jocn.2018.02.011. [Epub ahead of print]

Sialorrhea is a common distress associated with certain neurological disorders. The aim of this study is to compare the pharmacological agents used for treating sialorrhea by network meta-analysis. Electronic databases were searched for randomized clinical trials comparing active drugs with either placebo or other active drugs. Total drooling scores was the primary outcome measure. Inverse variance heterogeneity model was used for both direct and mixed treatment comparison analysis. Twenty one studies were included in the systematic review and 15 in the meta-analysis. Compared to placebo, benztropine, botulinum toxins A and B are associated with a significant reduction in the frequency and severity of drooling both in the overall neurological disorders as well as for children with cerebral palsy. Only botulinum toxin A and B were associated with significant therapeutic effects in Parkinson's disease. Benztropine and botulinum toxins A and B were observed to be effective in reducing sialorrhea associated with neurological disorders.

PMID: 29475576

23. A simulation study on the effects of neuronal ensemble properties on decoding algorithms for intracortical brain-machine interfaces.

Kim MK, Sohn JW, Lee B, Kim SP.

Biomed Eng Online. 2018 Feb 27;17(1):28. doi: 10.1186/s12938-018-0459-7.

BACKGROUND: Intracortical brain-machine interfaces (BMIs) harness movement information by sensing neuronal activities using chronic microelectrode implants to restore lost functions to patients with paralysis. However, neuronal signals often vary over time, even within a day, forcing one to rebuild a BMI every time they operate it. The term "rebuild" means overall procedures for operating a BMI, such as decoder selection, decoder training, and decoder testing. It gives rise to a practical issue of what decoder should be built for a given neuronal ensemble. This study aims to address it by exploring how decoders' performance varies with the neuronal properties. To extensively explore a range of neuronal properties, we conduct a simulation study. METHODS: Focusing on movement direction, we examine several basic neuronal properties, including the signal-to-noise ratio of neurons, the proportion of well-tuned neurons, the uniformity of their preferred directions (PDs), and the non-stationarity of PDs. We investigate the performance of three popular BMI decoders: Kalman filter, optimal linear estimator, and population vector algorithm. RESULTS: Our simulation results showed that decoding performance of all the decoders was affected more by the proportion of well-tuned neurons that their uniformity. CONCLUSIONS: Our study suggests a simulated scenario of how to choose a decoder for intracortical BMIs in various neuronal conditions.

PMID: 29486778

24. [Study of optimal parameters of scalp electroacupuncture for rehabilitation effect on children of cerebral palsy]. [Article in Chinese]

Jin B, Fu W, Li N, Xin Z, Liu C.

Zhongguo Zhen Jiu. 2018 Feb 12;38(2):143-7. doi: 10.13703/j.0255-2930.2018.02.009.

OBJECTIVE: To analyze the effect difference of wave, intensity, time and treatment frequency by orthogonal design so as to explore the optimal parameters of scalp electroacupuncture (EA) for rehabilitation effect on children of cerebral palsy. METHODS: Ninety children of cerebral palsy were assigned into 9 groups by orthogonal design, 10 cases in each one. The acupoints were bilateral excitable area, foot motor sensory area, speech two area, speech three area, balance area, and intelligent nine acupoints, including Shenting (GV 24), Sishencong (EX-HN 1), and bilateral Benshen (GB 13) and Touwei (ST 8). EA was applied at bilateral excitable area and speech three area. We designed an orthogonal experiment with four factors and three levels. We studied wave (sparse wave of 2 Hz, density wave of 100 Hz, sparse and density wave of 2 Hz /100 Hz), intensity (1 mA, 2 mA, intensity based on tolerance), time (10 min, 20 min, 30 min), frequency (once a day, once every other day, twice a week). The Gesell developmental scale was used to evaluate the developmental quotient (DQ); and gross motor function measure (GMFM), motor function before and after treatment. RESULTS: The optimal parameters for DQ and GMFM were 2 Hz/100 Hz, 20 min, once every other day. CONCLUSION: The optimal parameters for cerebral palsy may be 2 Hz/100 Hz, 20 min, once every other day.

PMID: 29473356

25. How Executive Functions Are Evaluated in Children and Adolescents with Cerebral Palsy? A Systematic Review.

Pereira A, Lopes S, Magalhães P, Sampaio A, Chaleta E, Rosário P.

Front Psychol. 2018 Feb 6;9:21. doi: 10.3389/fpsyg.2018.00021. eCollection 2018.

Aims: The aim of the present study was to examine how executive functions are assessed in children and adolescents with Cerebral Palsy. Method: A systematic literature review was conducted using four bibliographic databases (WebScience, Scopus, PubMed, and Psycinfo), and only studies that evaluated at least one executive function were selected. Both the research and reporting of results were based on Cochrane's recommendations and PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines. Results: The instrument most frequently used was the D-KEFS. All studies point to the existence of impairments in the executive functions among children and adolescents with Cerebral Palsy with an impact on several cognitive and life domains. Interpretation: There is a need to further systematize the research protocols to study the executive functions and their assessment in the intervention context. Findings of this review presented a diversity of tests (e.g., D-KEFS) or tasks (e.g., The inhibitory ability task) used with children with Cerebral Palsy. However, no information was given about adaptations performed to the test/task to meet Cerebral Palsy's specificities. Future research could consider including this information, which is key both to researchers and practitioners. The results of this study have important implications and suggestions for future avenues and guidelines for research and practice.

PMID: 29467685

26. Quality of Life in Mothers of Children with Cerebral Palsy.

Glinac A, Matović L, Delalić A, Mešalić L.

Acta Clin Croat. 2017 Jun;56(2):299-307. doi: 10.20471/acc.2017.56.02.14.

The aim of the study was to investigate whether there is difference in the quality of life between mothers of children with cerebral palsy and mothers of healthy children, as well as whether the quality of life in mothers of children with cerebral palsy depends on their level of education, child's mobility and child's functional status. A total of 141 mothers participated in the research. Mothers were divided into two groups, 71 mothers of children with cerebral palsy and 70 mothers of healthy children from the Tuzla Canton (Bosnia and Herzegovina). A multidimensional questionnaire PedsQL™ 2.0 Family Impact Mode was used for assessment of the impact of pediatric chronic health condition on the mothers' functioning. Th e level of functional disability of the child was measured by the Gross Motor Function Classification System (GMFCS levels I-V) scale. Mothers of children with cerebral palsy had poorer quality of life than mothers of healthy children in all investigated domains. In relation to mobility of the child, the quality of life was worse in mothers whose children did not move in the area of social functioning in comparison to mothers whose children had the ability to move independently. A statistically significant negative correlation existed between functional status of a child measured with GMFCS and social functioning of mothers, mothers' daily activities, parental functioning, family functioning, and overall quality of life of mothers.

PMID: 29485798

27. Health-related quality of life in children with cerebral palsy in low- and middle-income countries: opportunities and next steps.

Kakooza-Mwesige A.

Dev Med Child Neurol. 2018 Feb 22. doi: 10.1111/dmcn.13711. [Epub ahead of print]

PMID: 29473158

Prevention and Cure

28. Effects of umbilical cord blood cells, and subtypes, to reduce neuroinflammation following perinatal hypoxic-ischemic brain injury.

McDonald CA, Penny TR, Paton MCB, Sutherland AE, Nekkanti L, Yawno T, Castillo-Melendez M, Fahey MC, Jones NM, Jenkin G, Miller SL.

J Neuroinflammation. 2018 Feb 17;15(1):47. doi: 10.1186/s12974-018-1089-5.

BACKGROUND: It is well understood that hypoxic-ischemic (HI) brain injury during the highly vulnerable perinatal period can lead to cerebral palsy, the most prevalent cause of chronic disability in children. Recently, human clinical trials have reported safety and some efficacy following treatment of cerebral palsy using umbilical cord blood (UCB) cells. UCB is made up of many different cell types, including endothelial progenitor cells (EPCs), T regulatory cells (Tregs), and monocyte-derived suppressor cells (MDSCs). How each cell type contributes individually towards reducing neuroinflammation and/or repairing brain injury is not known. In this study, we examined whether human (h) UCB, or specific UCB cell types, could reduce peripheral and cerebral inflammation, and promote brain repair, when given early after perinatal HI brain injury. METHODS: HI brain injury was induced in postnatal day (PND) 7 rat pups and cells were administered intraperitoneally on PND 8. Behavioral testing was performed 7 days post injury, and then, brains and spleens were collected for analysis. RESULTS: We found in vitro that all UCB cell types, except for EPCs, were immunomodulatory. Perinatal HI brain injury induced significant infiltration of CD4+ T cells into the injured cerebral hemisphere, and this was significantly reduced by all hUCB cell types tested. Compared to HI, UCB, Tregs, and EPCs were able to reduce motor deficits, reduce CD4+ T cell infiltration into the brain, and reduce microglial activation. In addition to the beneficial effects of UCB, EPCs also significantly reduced cortical cell death, returned CD4+ T cell infiltration to sham levels, and reduced the peripheral Th1-mediated pro-inflammatory shift. CONCLUSION: This study highlights that cells found in UCB is able to mediate neuroinflammation and is an effective neuroprotective therapy. Our study also shows that particular cells found in UCB, namely EPCs, may have an added advantage over using UCB alone. This work has the potential to progress towards tailored UCB therapies for the treatment of perinatal brain injury.

PMID: 29454374

29. Epigenome-wide analysis in newborn blood spots from monozygotic twins discordant for cerebral palsy reveals consistent regional differences in DNA methylation.

Mohandas N, Bass-Stringer S, Maksimovic J, Crompton K, Loke YJ, Walstab J, Reid SM, Amor DJ, Reddihough D, Craig JM.

Clin Epigenetics. 2018 Feb 23;10:25. doi: 10.1186/s13148-018-0457-4. eCollection 2018.

Background: Cerebral palsy (CP) is a clinical description for a group of motor disorders that are heterogeneous with respect to causes, symptoms and severity. A diagnosis of CP cannot usually be made at birth and in some cases may be delayed until 2-3 years of age. This limits opportunities for early intervention that could otherwise improve long-term outcomes. CP has been recorded in monozygotic twins discordant for the disorder, indicating a potential role of non-genetic factors such as intrauterine infection, hypoxia-ischaemia, haemorrhage and thrombosis. The aim of this exploratory study was to utilise the discordant monozygotic twin model to understand and measure epigenetic changes associated with the development of CP. Methods: We performed a genome-wide analysis of DNA methylation using the Illumina Infinium Human Methylation 450 BeadChip array with DNA from newborn blood spots of 15 monozygotic twin pairs who later became discordant for CP. Quality control and data preprocessing were undertaken using the minfi R package. Differential methylation analysis was performed using the remove unwanted variation (RUVm) method, taking twin pairing into account in order to identify CP-specific differentially methylated probes (DMPs), and bumphunter was performed to identify differentially methylated regions (DMRs). Results: We identified 33 top-ranked DMPs based on a nominal p value cut-off of $p < 1 \times 10\text{-}4$ and two DMRs ($p < 1 \times 10\text{-}3$) associated with CP. The top-ranked probes related to 25 genes including HNRNPL, RASSF5, CD3D and KALRN involved in immune signalling pathways, in addition to TBC1D24, FBXO9 and VIPR2 previously linked to epileptic encephalopathy. Gene ontology and pathway analysis of top-ranked DMP-associated genes revealed enrichment of inflammatory signalling pathways, regulation of cytokine secretion and regulation of leukocyte-mediated immunity. We also identified two top-ranked DMRs including one on chromosome 6 within the promoter region of LTA gene encoding tumour necrosis factor-beta (TNF-β), an important regulator of inflammation and brain development. The second was within the transcription start site of the LIME1 gene, which plays a key role in inflammatory pathways such as MAPK signalling. CP-specific differential DNA methylation within one of our two top DMRs was validated using an independent platform, MassArray EpiTyper. Conclusions: Ours is the first epigenome-wide association study of CP in disease-discordant monozygotic twin pairs and suggests a potential role for immune dysfunction in this condition.

PMID: 29484035

30. Prediction of neurodevelopment at one year of age using the General Movements assessment in the neonatal surgical population.

Crowle C, Galea C, Walker K, Novak I, Badawi N.

Early Hum Dev. 2018 Feb 22;118:42-47. doi: 10.1016/j.earlhumdev.2018.02.001. [Epub ahead of print]

BACKGROUND: Recent evidence indicates neonatal surgery is associated with an increased risk of neurodevelopmental disability, including cerebral palsy (CP). Despite evidence for prediction of CP there is limited information on use of the General Movements Assessment (GMA) with this population. AIM: To investigate the utility of the GMA for prediction of neurodevelopment in an infant surgical population. STUDY DESIGN: Prospective cohort study Subjects: 278 infants following cardiac surgery (n = 149), non-cardiac surgery (n = 123) or both surgeries (n = 6). OUTCOME MEASURES: GMA at three months of age (mean 12 weeks, SD 1.6) rated by three assessors, two blinded to clinical details. Follow-up at one year of age (mean 372 days, SD 13) using Bayley Scales of Infant and Toddler Development III (BSID-III), clinical and neurological examination. RESULTS: At one year, none of the 248 (89%) infants with normal fidgety movements had a diagnosis of CP, however a large proportion (n = 118, 48%) demonstrated delayed development. Infants who had absent fidgety movements (n = 25, 9%) showed a significant difference on all subtests of the BSID-III ($p > 0.05$). For prediction of CP there was 100% sensitivity and 96% specificity. CONCLUSIONS: The GMA is a valid complementary assessment tool to enhance prediction of neurodevelopment, specifically CP, following early neonatal surgery and should be incorporated into routine follow-up for this population.

PMID: 29477915

31. Predictive validity of spontaneous early infant movement for later cerebral palsy: a systematic review.

Kwong AKL, Fitzgerald TL, Doyle LW, Cheong JLY, Spittle AJ.

Dev Med Child Neurol. 2018 Feb 22. doi: 10.1111/dmcn.13697. [Epub ahead of print]

AIM: To systematically review the predictive validity of spontaneous early infant movements for later cerebral palsy (CP). METHOD: Cohort studies with published data to calculate predictive validity of early spontaneous movements for later CP

were searched in four electronic databases: CINAHL, Embase, MEDLINE, and PsycINFO. RESULTS: Forty-seven studies met inclusion criteria. The Prechtl General Movements Assessment (GMA) during the fidgety period (10-20wks corrected age) had the strongest sensitivity: 97 per cent (95% confidence interval [CI] 93-99) and specificity: 89% (95% CI 83-93). The sensitivity and specificity of the Prechtl GMA during the writhing period (birth-6wks) was 93% (95% CI 86-96) and 59% (95% CI 45-71) respectively. Cramped-synchronized movements in the writhing period according to Prechtl had the best specificity (sensitivity: 70% [95% CI 54-82]; specificity: 97% [95% CI 74-100]). Hadders-Algra's method of assessing general movements had a pooled sensitivity and specificity of 89% (95% CI 66-97) and 81% (95% CI 64-91) respectively. Presence of asymmetric postures and movement quality/quantity were reported under the Hammersmith Infant Neurological Examination, Hammersmith Neonatal Neurological Examination, and Movement Assessment of Infants but had weak associations with later CP. INTERPRETATION: Fidgety movements assessed by the Prechtl GMA have the strongest predictive validity for later CP, but cannot be considered in isolation because of the presence of false positive results. WHAT THIS PAPER ADDS: Fidgety general movements (Prechtl) are most predictive for later cerebral palsy compared with other spontaneous movements. False positive results are high among all spontaneous movement assessments.

PMID: 29468662

32. Mild hypoxic ischaemic encephalopathy and long term neurodevelopmental outcome - A systematic review.

Conway JM, Walsh BH, Boylan GB, Murray DM.

Early Hum Dev. 2018 Feb 26. pii: S0378-3782(18)30124-5. doi: 10.1016/j.earlhumdev.2018.02.007. [Epub ahead of print]

AIMS: Hypoxic ischaemic encephalopathy (HIE) remains a significant cause of long term neurodisability despite therapeutic hypothermia (TH). Infants with mild HIE, representing 50% of those with HIE, are perceived as low risk and are currently not eligible for TH [1]. This review examines the available evidence of outcome in term infants with mild HIE. METHODS: Medline, Embase and Cochrane Clinical Trials databases were searched in March 2017. Studies with well-defined HIE grading at birth and standardised neurodevelopmental assessment at ≥18 months were included. Abnormal outcome was defined as death, cerebral palsy or standardised neurodevelopmental test score more than 1 standard deviation below the mean. RESULT: Twenty studies were included. Abnormal outcome was reported in 86/341 (25%) of infants. There was insufficient evidence to examine the effect of TH on outcome. CONCLUSION: A significant proportion of infants with mild HIE have abnormal outcome at follow up.

PMID: 29496329

33. Altered plasma-type gelsolin and amyloid-β in neonates with hypoxic-ischaemic encephalopathy under therapeutic hypothermia.

Benavente-Fernandez I, Ramos-Rodriguez JJ, Infante-Garcia C, Jimenez-Gomez G, Lechuga-Sancho A, Lubian-Lopez S, Garcia-Alloza M.

J Cereb Blood Flow Metab. 2018 Jan 1:271678X18757419. doi: 10.1177/0271678X18757419. [Epub ahead of print]

Hypoxic-ischemic encephalopathy (HIE) is a severe neonatal complication responsible for □23% of all neonatal deaths. Also, 30-70% of these patients will suffer lifetime disabilities, including learning impairment, epilepsy or cerebral palsy. However, biomarkers for HIE screening, or monitoring disease progression are limited. Herein, we sought to evaluate the clinical usefulness of plasma-type gelsolin (pGSN) and amyloid-beta (Aβ) 40 and 42 as prognostic biomarkers for HIE. pGSN has been previously suggested as a feasible marker in other brain injuries and amyloid-beta 40 and 42 are classically assessed in neurodegenerative diseases. However, to our knowledge, they have not been previously assessed in HIE patients. We have analyzed plasma pGSN and Aβ 40 and 42 levels in 55 newborns (16 controls, 16 mild and 23 moderate-severe HIE) at birth, during 72 h of therapeutic hypothermia, a gold-standard treatment for HIE, and 24 h after hypothermia. Aβ levels were lower in HIE patients, and pGSN levels were progressively reduced in mild and moderate-severe HIE patients. The fact that pGSN reductions could predict the severity of HIE and significantly correlated with the time to undergo hypothermia supports the prognostic value of plasmatic pGSN. Further studies are warranted to investigate the role of pGSN in neonatal HIE.

PMID: 29466895

34. Magnesium sulfate prevents cerebral palsy in premature infants.

Paulsen ME, Dietz RM.

J Pediatr. 2018 Mar;194:265-268. doi: 10.1016/j.jpeds.2017.12.079.

PMID: 29478499

35. Corticosteroids for the prevention of bronchopulmonary dysplasia in preterm infants: a network meta-analysis.

Zeng L, Tian J, Song F, Li W, Jiang L, Gui G, Zhang Y, Ge L, Shi J, Sun X, Mu D, Zhang L.

Arch Dis Child Fetal Neonatal Ed. 2018 Feb 23. pii: fetalneonatal-2017-313759. doi: 10.1136/archdischild-2017-313759. [Epub ahead of print]

OBJECTIVE: To determine the comparative efficacy and safety of corticosteroids in the prevention of bronchopulmonary dysplasia (BPD) in preterm infants. STUDY DESIGN: We systematically searched PubMed, EMBASE and the Cochrane Library. Two reviewers independently selected randomised controlled trials (RCTs) of postnatal corticosteroids in preterm infants. A Bayesian network meta-analysis and subgroup analyses were performed. RESULTS: We included 47 RCTs with 6747 participants. The use of dexamethasone at either high dose or low dose decreased the risk of BPD (OR 0.29, 95% credible interval (CrI) 0.14 to 0.52; OR 0.58, 95% CrI 0.39 to 0.76, respectively). High-dose dexamethasone was more effective than hydrocortisone, beclomethasone and low-dose dexamethasone. Early and long-term dexamethasone at either high dose or low dose decreased the risk of BPD (OR 0.11, 95% CrI 0.02 to 0.4; OR 0.37, 95% CrI 0.16 to 0.67, respectively). There were no statistically significant differences in the risk of cerebral palsy (CP) between different corticosteroids. However, high-dose and long-term dexamethasone ranked lower than placebo and other regimens in terms of CP. Subgroup analyses indicated budesonide was associated with a decreased risk of BPD in extremely preterm and extremely low birthweight infants (OR 0.60, 95% CrI 0.36 to 0.93). CONCLUSIONS: Dexamethasone can reduce the risk of BPD in preterm infants. Of the different dexamethasone regimens, aggressive initiation seems beneficial, while a combination of high-dose and long-term use should be avoided because of the possible adverse neurodevelopmental outcome. Dexamethasone and inhaled corticosteroids need to be further evaluated in large-scale RCTs with long-term follow-ups.

PMID: 29475879

36. [Growth factors and neurotrophic control in the 'motoneuron - muscular fiber' system in children with cerebral palsy].

[Article in Russian; Abstract available in Russian from the publisher]

Korsunskaya LL, Larina NV, Vlasenko SV.

Zh Nevrol Psikhiatr Im S S Korsakova. 2018;118(1):115-122. doi: 10.17116/jnevro201811811115-122.

The article deals with the role of neurotrophic and growth factors in the development and functioning of the nervous system. The authors present general information on neurotrophic control and its role in the interaction of motor neurons and innervated muscle fibers.

PMID: 29460916